Miniature Ground Mapping LADAR, Phase I

Completed Technology Project (2006 - 2006)

Project Introduction

System & Processes Engineering Corporation (SPEC) proposes a miniature solid state surface imaging LADAR, for imaging the landing areas providing precision surface profile and range to impact. The LADAR utilizes an advanced hybridized detector Readout Integrated Circuit (ROIC) single chip solution that supports an integrated detector and ROIC configuration enabling a single chip LADAR receiver solution capable of operating at multiple wavelengths. This single chip receiver is combined with multiple laser diodes to give a miniature flash LADAR with high frame rates, 3mm range accuracy, low power draw and small data frames (100x smaller than typical LIDARS). The LADAR provides the range and amplitude of the first three targets encountered in each pixel, giving the ability to detect subpixel rocks and craters without overwhelming data rates or image processing. The integrated Micro Channel Plate (MCP) allows ultra high receiver sensitivity, with high gain and wavelength flexibility by changing the photo cathode materials. The use of a MCP with CMOS chip anode pickup pixels, allows the chip to be vertically integrated using a standard CMOS process, the pickup anode on the top layer, the sample and holds and amplifiers below.

Anticipated Benefits

Potential NASA Commercial Applications: There are many DOD UGV and UAV applications for the MGML system for collision avoidance and to accurately locate and identify objects. Commercial applications for 3D imagers on UGV include robots utilized for bomb identification and disposal, 3D imaging for Police Tactical Units and robots, and 3D imaging for Fire Departments, Search and Rescue, Underground Workers, Construction and Mining. The discrimation capability of the MGML system will provide for the capability to allow for detection.

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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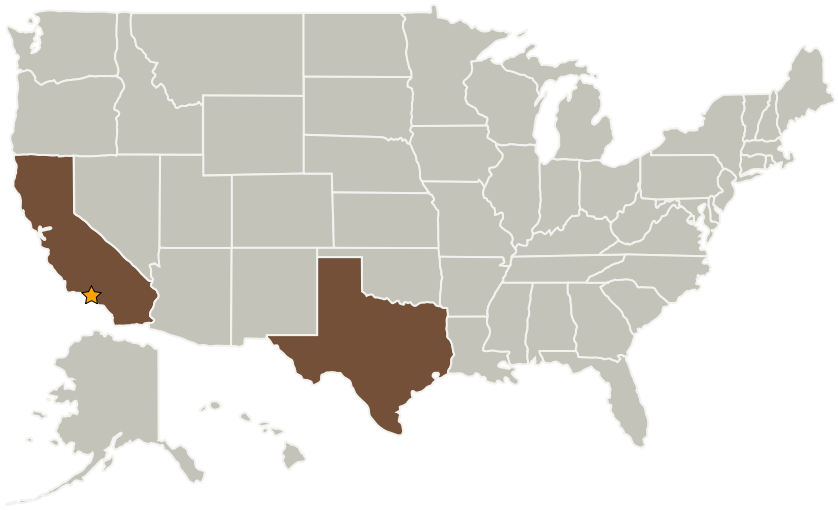
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Systems & Processes Engineering Corporation	Supporting Organization	Industry Veteran-Owned Small Business (VOSB)	Austin, Texas

Primary U.S. Work Locations	
California	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Brad Sallee

Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.5 Autonomous Rendezvous and Docking
    - TX04.5.1 Relative Navigation Sensors